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Ontario Hydro
Annual Report/1979

AR31



Ontario Hydro's board of directors view a model of a transmission station designed to operate with SF6 gas-insulated switchgear. The directors are (left to right) William A. Stewart; William E. Raney, Secretary and General Counsel; J. Dean Muncaster; Sister Mary; Arthur J. Bowker, Vice-chairman; Hugh L. Macaulay, Chairman; Douglas J. Gordon, President; Allen T. Lambert; Robert J. Uffen; J. Conrad Lavigne; Alan B. Cousins; and A. Ephraim Diamond. Absent: Philip B. Lind, William Dodge.

Report of the Board of Directors of Ontario Hydro for the year 1979

To The Honourable Robert Welch, Minister of Energy

We, the Board of Directors, submit to you this report of the financial position and relevant Ontario Hydro activities for the year 1979.

We would also like to thank you and the staff of the Ministry of Energy for the cooperation and understanding extended during the year.

On behalf of the Board



Hugh L. Macaulay
April, 1980

THE COVER

Ontario Hydro is actively investigating alternative energy sources, such as solar power, in an effort to reduce consumption of conventional electricity. Hydro researcher James Tschirhart tests and evaluates the performance of a commercially-available solar collector installed on the roof of the W. P. Dobson research laboratory on Kipling Avenue, Toronto.



The Chairman comments: an interview with Hugh Macaulay

Q. Why is Ontario Hydro increasing its dependence on nuclear generation?

A. The answer is that we really don't have, at this time, any alternative. Only small-scale hydraulic potential sites are left and these are being explored. The burning of fossil fuels for electrical generation is becoming increasingly uneconomical because of skyrocketing prices. And then there is security of supply: Ontario has no deposits of oil or natural gas and little coal, so uranium is our only large scale alternative. Admittedly the capital costs of nuclear generation are high — and this concerns me greatly — but its fuel is comparatively cheap. Alternative energy sources such as solar, wind and biomass — which, along with the Ministry of Energy, we are investigating actively — seem a long, long way from practical application on a major scale. So when you add it all up, nuclear power will play an increasing role because it's cheaper than fossil fuel, it's relatively pollution free, it has a proved safety record in Ontario, and until something better comes along, that's where the emphasis is going to be.

Q. How do you answer people who say to you, "Is nuclear power safe?"

A. My answer is "yes, it is safe." And I would point out that the government's Select Committee on Hydro Affairs, recognizing the fact that few things in

this world can be proven absolutely safe, concluded after considerable investigation and deliberation that our CANDU reactor is "acceptably safe." However, despite our proven safety record, Ontario Hydro and the federal regulatory authorities are doing everything that is humanly and reasonably possible to enhance that record.

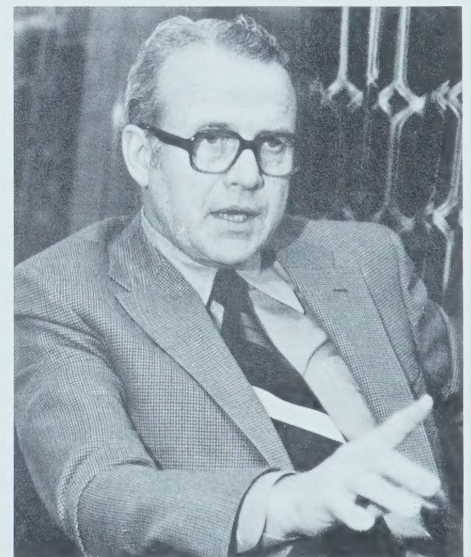
Q. Why are Ontario Hydro's rates increasing and what are the prospects for the future?

A. Because our costs are going up, the same as everybody else's. I'm very hopeful that our rate increases toward the end of the decade may be less than the rate of inflation. But I don't think there's any way that we're inflation-proof. I don't think we can beat the trend of all the costs that are around us. And Hydro's mandate is to provide power at cost, which means our costs are passed along to our customers. The Ontario Energy Board late in 1979 came out with a lengthy report supporting this principle. So as long as costs keep climbing, so must rates.

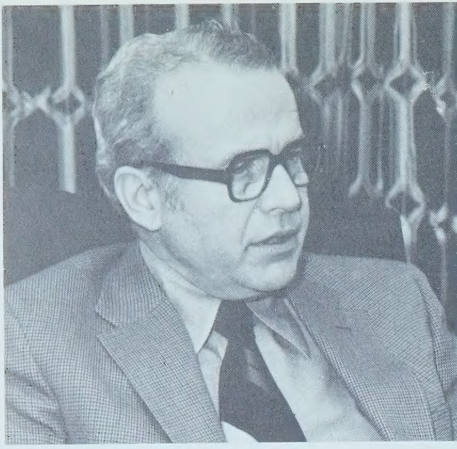
Q. How could Hydro be so far out in its forecasts of our electric needs? Only a few years ago you were forecasting growth of six to seven per cent; now you are down to 3.4 per cent.

A. It has often been said that the only thing forecasters know for sure is that

they are going to be wrong. But forecasting is absolutely necessary because it takes about 14 years to get a power plant from the drawing boards to generating electricity. That means the plants we're bringing on line now were planned in the mid-sixties. And back then who could have predicted the roller-coaster ride ahead with Middle-East oil embargoes,



"The burning of fossil fuels for electrical generation is becoming increasingly uneconomical . . ."



"It is my goal, and a corporate objective, to be completely open with the public."

shocking OPEC price increases, declining economic growth and a falling birth rate? Those are the events that threw forecasts by electrical utilities all over the world out of whack. And it is to those events that we are adjusting now. Fortunately, our forecasts erred on the high side, for as I have pointed out, in this business it takes a long time to catch up.

Q. Since electricity is a manufactured product, why isn't Ontario Hydro aggressively pursuing the sale of export power to the United States?

A. We have sought and are seeking sales of export power to the United States. In 1979 alone our U.S. sales totalled \$345 million, which not only meant a net benefit of \$154 million, but was a major contribution to Canada's balance of payment situation. But you must also realize Hydro only exports interruptible power — power that can be cut off to meet Ontario's needs. So exporting electricity does not threaten our security of supply, and the revenue from the exports helps absorb the costs of power here at home. However, there are environmental considerations, and these must be balanced against the economic benefits to Ontario and Canada.

Q. Ontario Hydro is one of the few utilities in Canada that charges its rural customers more than its urban customers. Can you explain this situation?

A. Hydro is obliged by statute to base its rates on costs — a tenet recently supported by the Ontario Energy Board. Since it generally costs more to distribute electricity in rural areas where densities are lower and distances

greater, those costs are reflected in the higher rates. If the rates were equalized, urban and industrial rates would have to increase or some other form of subsidization would have to be found. Unfortunately, I don't see an immediate solution to this problem, but we are trying to find an answer that may reduce the differential.

Q. Despite the cutbacks and delays in Hydro's expansion program, the number of Hydro employees is increasing. How do you explain this?

A. The expansion program may have been cut back, but electricity demand is still growing, albeit at a reduced rate. So as long as that is the case we'll need more people to provide adequate service. Another factor in our increased numbers is the Board of Directors' determination to be more publicly responsive, to provide for greater public participation in our planning, to provide the various government boards, committees, inquiries and commissions with more complete details and explanations of our activities. This requires more people to handle the workload. However, I have satisfied myself that Hydro is an efficient, well run organization. I can say that because its efficiency was established long before I came along. It's pretty trim and lean, but that doesn't mean trimmer and leaner wouldn't be better.

Q. Some critics claim Ontario Hydro is not responsive to government policy directives and is so big that it's uncontrollable. What is your reaction to that?

A. That is just not so. Hydro is large; we cover a lot of territory and operate widely. Anything that big gives the appearance of being unable to change direction, to respond to changing circumstances. But that is not an accurate reflection of what actually goes on. The Ontario government does have ultimate control of Ontario Hydro. It appoints the Board of Directors and can in that sense make its views effectively felt. And the Board, while sitting as an independent body, does operate within the broad policy framework of government. I think we are getting better at relating to government, and as a matter of fact, both parties are close to agreement on a memorandum of understanding that sets out clearly our responsibilities and inter-relationships.

Q. Picking up on the theme of being publicly responsive, hasn't this public involvement created costly delays and

over-complicated the planning process?

A. The simple answer is yes. But as somebody said about our justice system, it may not be perfect but it's the best idea anybody has come up with yet. As you know, the whole climate of our society has changed over the last 10 or 20 years. Everybody wants a bigger part in the decision making process. If we failed to create the means whereby that involvement could be achieved, we'd have pressures on our system that would be very serious indeed. But frustrating, time-consuming and expensive as it is, it's an awful lot better than the alternative. Therefore it is my personal goal, and a corporate objective, to be completely open and frank with the public.

Q. In the past year acid rain has been identified as a major problem of the 1980s. What is Hydro's position?

A. We recognize it as a major national and international problem, a problem that has developed over several decades and that cannot be solved overnight. It concerns not only the burning of fossil fuel for electrical generation but smelting, refining, chemical processing and transportation on both sides of the



"I don't think we can beat the trend of all the costs that are around us."

border. While Hydro has set up a steering committee to study the identification and control of acid gas emissions at our generating stations, it would be improvident to spend millions of dollars only to see a small return on our investment. The Ontario Legislature's Standing Committee on Resources Development has recommended that all existing and planned coal-fired stations be equipped with the



"It's pretty trim and lean, but that doesn't mean trimmer and leaner wouldn't be better."

best technology available to control acid precipitation. We agree, but any Hydro initiatives must be coordinated with federal, provincial and United States authorities if the overall result is to be meaningful.

Q. Surely the announced cutbacks in Hydro's generation program augurs badly for the economy of Ontario, especially in our nuclear industry. Shouldn't Hydro be priming the economic pump through continued construction and promoting the sale of power?

A. When Hydro expands its activities and grows with the province's needs there is a beneficial effect, but it's a lock-step process of simultaneous expansion of the economy and Hydro's capacity to meet it. I don't believe Hydro's primary responsibility is promoting economic growth in the province. Hydro is not in the promotion business. Our responsibility is to meet the electric needs of the province and to give the people of Ontario all the facts and all the information at its disposal. On the basis of that information, the people of Ontario will make up their own minds about what they are going to do. And another point: what we've done for some projects — Darlington, for example — is to stretch the construction period. What this means is that the timing of that investment is different. The investment itself isn't disappearing and in that sense it's making just as big a contribution to the economic development of the province, whether it's over a 10-year period or a 12-year period. The only

thing that has changed is the timing.

Q. Looking back on your first year at Ontario Hydro, what are your major impressions?

A. I guess my major impression concerns the people I have met and with whom I work. I know it always sounds trite when a chairman lauds the employees, but Hydro is recognized around the world as one of the most efficient and reliable electric utilities in the business. That reputation was earned, without a doubt, by the efficiency and dedication of Hydro's people. As you know, I was appointed to the Board last year and took over the office of chairman from Robert Taylor in July. He did a lot of the initial spade work following the change from the old electric power commission structure and we are indebted to him for his devoted efforts. Also I would like to pay tribute to Hydro President Doug Gordon, who late in the year announced his intention to taking early retirement in November, 1980. His contributions to Hydro over 35 years of service are beyond measure. I would also like to acknowledge the outstanding services of Robert Hay of Kingston who retired from the Board of Directors this year, and to welcome the new appointees, A. Ephraim Diamond of Toronto and Alan B. Cousins of Wallaceburg. Another group that has impressed me tremendously is the municipalities and their associations, the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities.



"Hydro is recognized as one of the most efficient utilities in the world."

The year was one of challenge for Ontario Hydro

The year 1979 was one of challenge for Ontario Hydro — challenge from an environmentally conscious public, from an economy slowed by inflation and rising interest rates, and from a province determined to reduce its dependency on external energy supply.

While meeting these challenges, Ontario Hydro continued to set records in the production of nuclear and hydraulic power and to meet record demands for electricity from its customers.

Primary energy demand in 1979 was up by 2.9 per cent, compared to 2.7 per cent the previous year. Although this demand represents the highest ever, revised Hydro forecasts issued in January, 1980, indicate Ontario's need for electricity is expected to grow by an average of 3.4 per cent annually to the year 2000. This is down from the 1979 forecast of annual growth of 4.5 per cent.

Generation of electricity by water power was at record highs in 1979, increasing to 38.8 billion kilowatt-hours and providing 35 per cent of the total energy made available. The previous high for hydraulic generation was in 1974, when 37.8 billion kilowatt-hours were produced. The upgrading of generating capacity of Hydro's hydraulic units at Abitibi Canyon, Des Joachims and Robert H. Saunders on the St. Lawrence River was in good part responsible for record production from this renewable resource.

Ontario's other energy resource — uranium — provided another 29 per cent of the total production in the form

of nuclear power. Nuclear generation increased by 11.6 per cent from 1978, displacing thermal generation in terms of total amount of energy generated in one year.

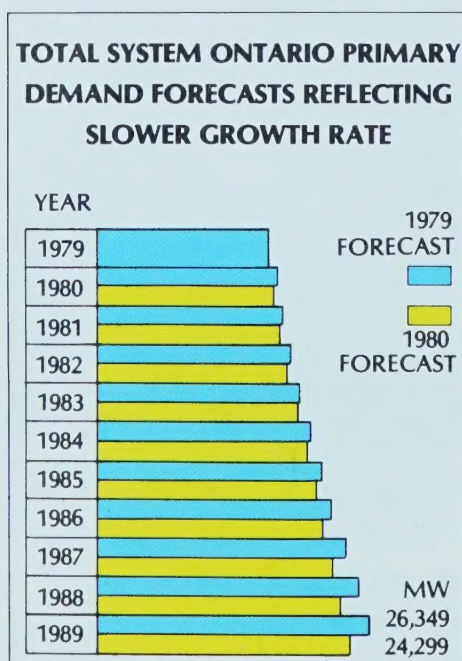
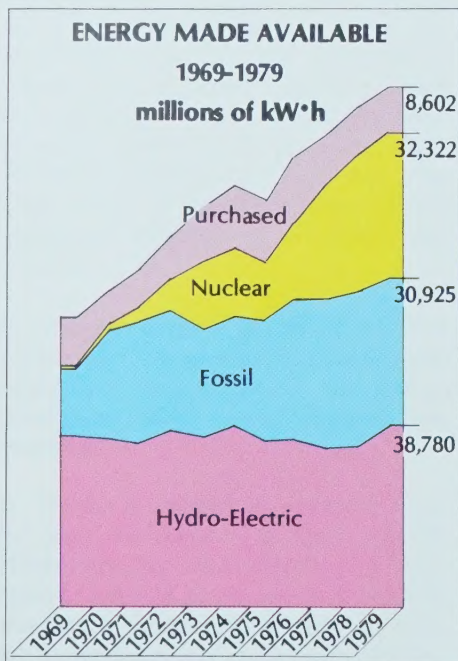
And Hydro's eight nuclear reactors at Pickering and Bruce generating stations continued to rank in the top 36 — four in the top 10 — when compared to the performance of 104 of the world's largest reactors.

Sales again set records

Peak demand set a record on December 17, 1979, reaching 16,365,000 kilowatts. At the time of the peak, dependable peak capacity was 4.5 per cent higher than in 1978 — 23,879,000 kilowatts. The generation mix for dependable peak capacity is made up of 21.1 per cent nuclear, 50.1 per cent thermal, 27.1 per cent hydraulic and 1.7 per cent purchased.

Also during 1979, sparked by the Three Mile Island incident in the United States, the provincial Legislature's Select Committee on Hydro Affairs conducted an extensive examination into the safety of Hydro's CANDU system. After many weeks of testimony and deliberation it concluded Hydro's nuclear reactors are "acceptably safe."

Sales of electrical energy to the United States again set records, increasing from 10.4 billion kilowatt-hours in 1978 to 11.7 billion kilowatt-hours in 1979, a growth of 12.4 per cent. Such sales, valued at \$345 million, yielded an estimated \$154 million in net benefit that is passed on to Ontario consumers.



Don Huston checks for faulty insulators on a transmission line near Guelph with a tester developed by Hydro that can safely be used on a live line.



Energy Made Available: 1979

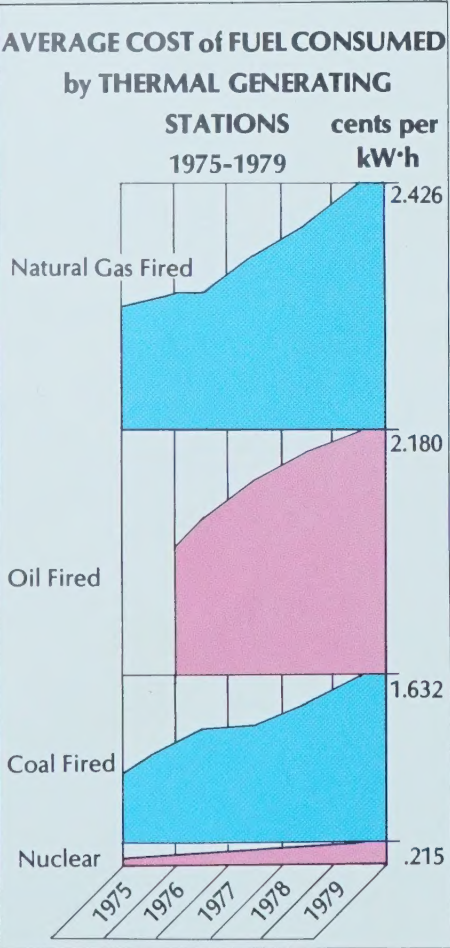
	1979 Millions of kW•h	1978 Millions of kW•h	% Change Over 1978	% of Total 1979	% of Total 1978
Hydraulic	38,780	35,834	8.2	35.1	33.6
Thermal (coal)	28,540	27,073	5.4	25.8	25.4
Thermal (natural gas)	1,481	2,079	— 28.8	1.3	2.0
Thermal (oil)	904	1,739	— 48.0	0.8	1.6
Thermal (nuclear)	32,322	28,966	11.6	29.2	27.1
Total generation	102,027	95,691	6.6	92.2	89.7
Purchased*	8,602	11,042	— 22.1	7.8	10.3
Total energy made available	110,629	106,733	3.7	100.0	100.0

*Includes non-sale transfers

Almost all of these sales were to neighboring utilities in Michigan and New York. About 30 per cent provided assistance during shortfalls in generating capacity while 70 per cent displaced higher-cost generation by older coal-fired units and those burning oil and gas. In the previous year, 45 per cent of export sales provided assistance in meeting shortfalls.

Generation program

During 1979 and in the early months of this year, the Board of Directors, faced with reduced forecasts of electrical demands to the year 2000, made alterations to Ontario Hydro's long-range construction program.



In matching the expansion program to the 1980 forecast, the Board chose a course of stretching construction periods rather than cancellations. This decision took into account the economics of production, the cost penalties of changing construction schedules, security of supply and the effects on employment. It also considered the fact that even with the reduced forecasts, the estimated peak demand in the year 2000 will be about 31.7 million kilowatts, more than double the peak demand of 15.5 million kilowatts in 1979 for the East System.

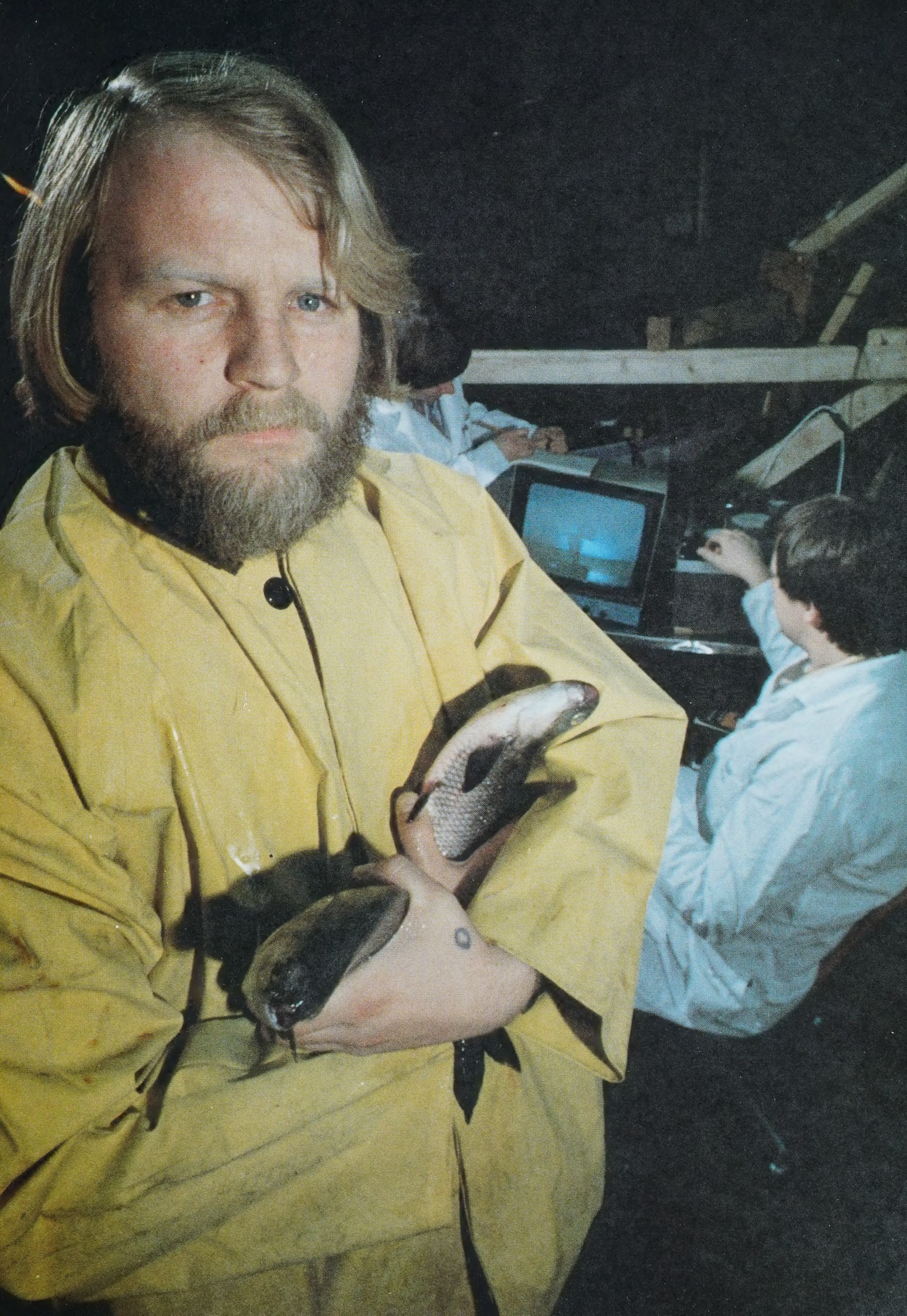
The Board also examined the escalating cost of oil and natural gas and its possible effect on Hydro's load requirements. The price disadvantage electricity had over these fuels is disappearing, particularly for water and space heating.

After considering all these factors, in early 1980 the Board decided to continue construction of the Atikokan thermal station and the Bruce B station and further stretch out the Darlington nuclear station. Earlier in 1979, the Board had decided to halt construction of the second half of the Bruce Heavy Water Plant D and complete the first half, then mothball it until needed, and to stretch out Darlington.

Reviewing the short-term five-year requirements, the Board decided to move four units at the Richard L. Hearn thermal generating station from reserve and mothball them. Availability of two units at Lennox was reduced to 16 hours a day, five days a week, while the two remaining units at this oil-fired generating station remain in frozen reserve. Construction at the oil-fired Wesleyville station was stopped following completion of the powerhouse, and the project was placed in mothball status.

Meanwhile, detailed design work continued in 1979 on the Atikokan thermal generating station. The two-unit 400,000-kilowatt station is

Gizzard shad like the ones held by researcher Dave Lowther of Hydro's chemical research department are notorious for clogging the cooling water intakes at some Hydro plants. Lowther and his colleagues, Paul Patrick and Pat Lowe, are studying fish movements in an effort to solve the problem.



Power was supplied to 2,800,000 customers

scheduled to be in operation in two phases, in 1984 and in 1988. Construction of a 300,000-kilowatt two-unit extension for the Thunder Bay thermal generating station was three-quarters complete by the end of 1979.

Other thermal generation activities in 1979 included an extensive generator modification program at Nanticoke to improve reliability of the eight 500,000-kilowatt units. Also at Nanticoke a coal blending system to achieve a 50/50 mix of coals from Canada and the United States was placed in operation. At the J. Clark Keith station modifications to improve environmental control equipment were completed.

In the nuclear field, construction on the Bruce Heavy Water Plant B was completed early in 1979. The plant has been commissioned and is expected to be in full operation this year. Bruce Heavy Water Plant A produced 599.8 megagrams (661.2 tons) of reactor-grade heavy water in 1979.

A control room simulator for Bruce A nuclear generating station was ordered in 1979, and will provide an invaluable training aid for station personnel. The unit will be a replica of the control room and is wired to computer systems that simulate generating station operations. The computers are able to simulate various nuclear operations, including emergencies, enabling operators to study and practice effective counter-measures.

At Pickering B nuclear station, Ontario Hydro and Babcock & Wilcox (Canada) Ltd. reached an agreement on rebuilding faulty boilers. Estimated costs for rebuilding 34 boilers is \$45 million, with Babcock & Wilcox paying \$35 million.

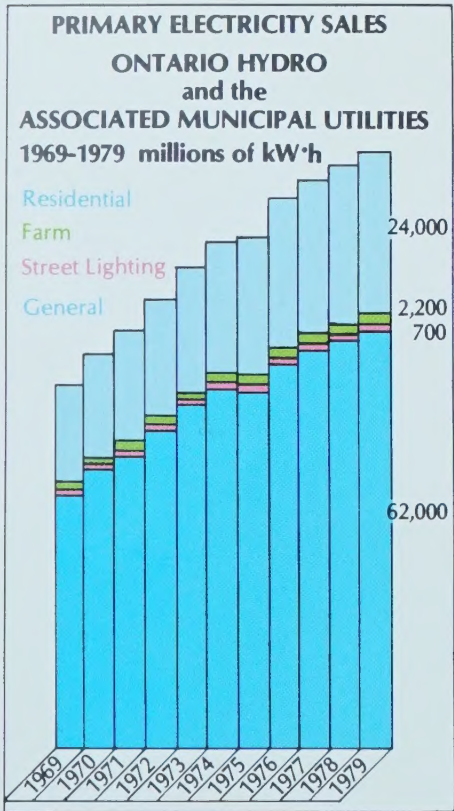
Babcock & Wilcox boilers were the subject of several weeks of examination by the provincial Legislature's Standing Committee on Resources Development. The committee recommended the posting of performance bonds and pointed out the dangers of dependence on one supplier. Hydro indicated general agreement with the committee recommendations and initiated action as a follow-up to the report.

Customers, Rates and Costs

During the year, power was supplied under cost contracts to 332 associated municipal electrical utilities for resale to more than 2,100,000 retail customers. The rural distribution system additionally provided service to 771,000 customers outside the municipal system. At the end of 1979, Ontario Hydro also provided service to 112 direct customers.

As a result of municipal restructuring, about 18,500 Ontario Hydro customers, together with distribution system plants valued at \$11.5 million, were transferred to new utilities in

Land use in the province's vast agricultural areas is an important aspect of Hydro operations. Here gardener Vince Crognale checks plants in his care.



Carpenters such as Roy Bickerstaffe and Garth Stewart (foreground), who work in the Central Services Division, are every bit as large a part of Hydro's team as the corporation's linemen, and head office personnel.



This work received international attention

Vaughan, Richmond Hill and Markham in the Regional Municipality of York. About 1,200 customers, and plant valued at \$850,000, were transferred to the new Welland Hydro-Electric Commission in the Regional Municipality of Niagara.

Increases in wholesale power rates announced in 1979 following public hearings by the Ontario Energy Board were implemented on January 1, 1980. The increases amounted to an average of 8.6 per cent to the municipalities and 7.1 per cent to direct industrial customers. Retail rates to rural customers went up by 6.2 per cent.

A time-of-use rate experiment was begun in 1979, and will continue for several years, to determine the feasibility of customers shifting their power demands to off-peak hours. Some 1,000 customers, residential, industrial and commercial, will be involved.

In 1977 and 1978 Ontario Hydro's revenues exceeded the amount allowed within the spirit and intent of the Anti-Inflation program guidelines by \$252 million. This money, with interest, was applied to reduce customers' bills in 1978 and 1979, limiting the average net wholesale power rate increase to 5.9 per cent a year.

Responding to a recommendation by the Ontario Energy Board, Ontario Hydro began a series of surveys in 1976 to determine the value of electric service to rural, municipal and direct industrial customers. These surveys were completed in 1979. They included large and small industrial customers, residential customers, farms, retail trades and services, government agencies, institutions and office buildings. This work has received international attention and is instrumental in planning an economical level of electric service reliability for the communities Hydro serves.

An important report

Hydro staff is examining the recommendations and background in the costing and pricing report which was released in December by the Ontario Energy Board. It is an important report on a subject which has been under examination for more than two years.

The Hydro Board of Directors, which has the ultimate responsibility to approve any changes to methods of costing and pricing electricity in Ontario, will establish the broad principles within which detailed changes in costing practices and rate

Researcher Bob Goodman checks heat loss with an air leak measurement system.



Lineman Leonard Muegge and a Hydro helicopter — an efficient mix of man and machine — team up to complete a line restringing operation near Chatham.



Hydro continued to stress conservation

structures could be developed.

Ontario Hydro, through advertising, seminars and other information programs, continued to stress energy conservation. Its message stressed, "Use what you need — but need what you use." Major load management test programs are continuing for 1980.

In addition, Ontario Hydro is co-operating with manufacturers of appliances and electric motors and the Canadian Standards Association to develop test methods of performance and reduce energy consumption.

Transmission Systems

During 1979, Ontario Hydro crews completed construction of 61 circuit kilometres (38 circuit miles) of transmission line. The new transformer stations at Milton and Trafalgar are the first in the system to operate with SF6 gas-insulated switchgear on a 500-kilovolt line. This modern equipment allows much more compact design for transformer stations. Property negotiations have resumed for the completion of the 500 kilovolt line between the Bruce generating station and

Milton. It is expected to be operational by mid-1980.

Delays resulting from legal action by groups opposed to transmission line routing, despite approval by the Ontario Municipal Board, resulted in considerable power being locked-in at Bruce at an estimated cost of about \$2 million a month. The costs are incurred by Hydro having to use imported coal to replace the cheaper, uranium-fuelled nuclear power locked in at Bruce, along with high transmission-line losses.

Throughout 1979, considerable work was done on improving and upgrading existing 230-kilovolt transmission lines and stations, particularly in design and construction methods for stringing compact conductors, strengthening existing towers and making design changes to permit increased currents. New standards for grounding fences and buildings near transmission lines were developed.

During the year, more than 1,000 people visited Hydro's Transmission Effects Demonstration Centre near Barrie, the only one of its kind in North America. The centre was designed to demonstrate the electrical and agricultural effects of 500-kilovolt transmission lines in farming communities. Groups from other utilities in Canada and North America, a large number of farm organizations and other interested persons visited the site since it opened in 1976.

In 1979, a number of projects to select routes for new transmission systems — many of them only a few miles in length — and sites for new generating facilities were in progress. Regulatory authorities approved 20 projects for property acquisition and construction.

Recognizing the importance of public participation in such project work, Ontario Hydro actively sought planning participation by the public and all levels of government. The public was also involved in several long-range planning studies and community and social studies.

Valuable information on site and facility selection was contributed by some 20 committees of local citizens throughout Ontario. An integral part of the program was the preparation of informative literature and some 25,000 pieces were distributed. More than 125 staff presentations were made to local councils and groups interested in transmission and generation projects. Information centres were established



Technician Craig Donovan obtains pertinent meteorological data with instruments attached to a balloon as part of Hydro's continuing environmental studies.

Last fall, public meetings were held in the Bowmanville area to inform residents of plans for Hydro's nuclear plant at Darlington and to allow them an opportunity to question a number of senior Hydro officials.



Hydro sought participation by the public

and used to provide local citizens with and opportunity to contribute toward plans that affect their community.

Last summer, Dr. Arthur Porter and his colleagues on the Royal Commission on Electric Power Planning issued reports on the need for additional bulk power facilities in the eastern and southwestern regions of the province. At that time, Ontario Hydro expressed reservations about some aspects of the reports but concurred with the commission's recommendations to strengthen the supply of power to both regions.

Fuel Supplies

During 1979 Ontario Hydro spent \$606 million on fuels for generation, compared to \$487 million in 1978 — an increase in costs of 24 per cent.

Total deliveries of coal from mines in the United States was 9.9 million megagrams (10.9 million tons) during the year. Western Canadian bituminous coal continued to move through the newly developed integrated transportation system and 2.2 million megagrams (2.4 million tons) were delivered, principally to the Nanticoke generating station.

This thermal property analyzer being checked by engineer Tony Griffin uses a microprocessor to determine the backfill requirements for buried cable.



Deliveries of residual oil totalled 0.1 million cubic metres (600,000 barrels) for use at the Lennox generating station and for steam production at the Bruce Heavy Water Plant. Deliveries of natural gas were 461.4 million cubic metres (16.3 billion cubic feet), 43.6 per cent less than in 1978. A total of 711.8 megagrams (785 tons) of uranium was used in 1979 to produce electrical energy and 45.8 megagrams (50 tons) for energy in the form of steam. Delivery of uranium concentrates containing 300 megagrams (331 tons) of uranium was made early in the year under a leasing agreement with Uranium Canada Limited. Development of facilities for production of uranium supplies continued in 1979 under contract with two Elliot Lake producers, Denison Mines Limited and Preston Mines Limited.

Ontario Hydro continued its involvement in uranium exploration programs being carried out by Shell Canada Limited, Amok Limited and Norcen Energy Resources Limited. It has recently become involved with a program being carried out by Canadian Nickel Company Limited.

Purchases

Contract awards by Ontario Hydro during 1979 were valued at \$1.6 billion, a decrease of \$600 million from 1978. During the year, outstanding commitments decreased from \$2.7 billion in 1978 to \$2.6 billion in 1979.

Excluding fuel, value of 1979 purchases directed to Canadian sources was 77.8 per cent of the total. Nearly 90 per cent of this business was awarded in Ontario. This represents an annual rise of 2.1 per cent in Canadian contract awards.

Health and Safety

One occupational fatality in the Ontario Hydro workforce and one in the workforce of an on-site contractor occurred in 1979. Although these numbers are lower than in previous years, improvement will be considered significant only if such performance is measured over several years. The overall disabling injury rate was six per million man-hours and the days lost due to injury were 0.49 per cent of working days.

In October 1979 the Occupational Health and Safety Act, with associated regulations, became law. Ontario Hydro has made effective progress within its various work groups in implementing the statutory requirements.

Geotechnician Philip Milford uses a Winkie drill to investigate the physical condition of an underground water conduit during the regular maintenance shutdown of an Ontario Hydro hydraulic plant at Niagara Falls.



Employee health and safety were emphasized

A high standard of performance in radiological safety was again recorded in 1979 with no occupational or public fatalities or injuries occurring due to exposure to radiation in the nuclear power program. Environmental emissions of radioactivity were generally within the target of one per cent of the Atomic Energy Control Board's approved emission limits.

Development work in the measurement and monitoring of Carbon-14 continued. Sampling and stack monitoring capability was established and an initial Derived Emission Limit was proposed.

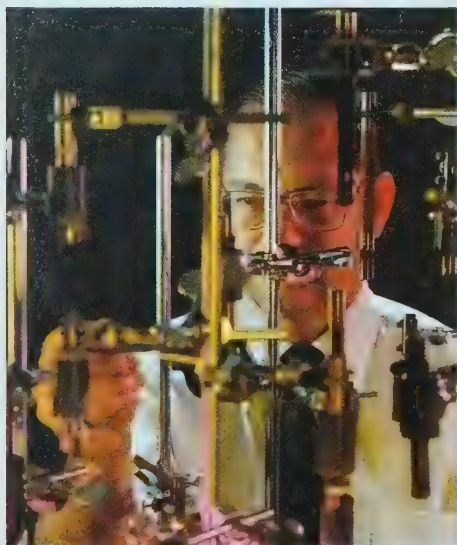
A service was established for measuring PCB concentrations in air and workplaces and workers were monitored in locations where PCBs are handled. Measured concentrations and exposures were a small fraction of established regulatory limits.

Employees

Collective agreements with employees belonging to The Society of Ontario Hydro Management and Professional Staff and the Ontario Hydro Employees' Union were renewed. Increases in wages, averaging 8 per cent during 1979, along with benefits and working conditions, were comparable to those of other major corporations in Ontario.

In 1979, Ontario Hydro employed an average of 28,385 persons. Staff levels across the Hydro organization were frozen in 1979 until work programs for the 1980-84 period were reviewed and approved in early 1980.

Chemical researcher Larry Gibson studies the corrosion effects of faulty boiler water on a steam generator system in a Hydro laboratory.



Research and Development

Research continued into a broad range of environmental and energy utilization problems, together with detailed high-technology research in all aspects of electrical generation.

In the environmental field, scientists and technicians reported progress in the disposal of polychlorinated biphenyls (PCBs), while studies continued into a process for physical and chemical treatment of coal to remove sulphur, ash and trace elements before shipment from the mines.

As part of the Ministry of Energy's alternative energy program, Ontario Hydro will be monitoring and assessing the performance of the solar collectors and heat exchange system to be installed in the corporation's new Thermal Training Centre in Mississauga.

Similar monitoring is going on in an experimental, electrically-heated house built by the Housing and Urban Development Association of Canada. The house utilizes a ventilation system designed and installed by Ontario Hydro which recovers heat from the exhausted air.

The management of radioactive wastes has become a matter of great importance and of major public interest in Canada and other parts of the world. Under the Canada-Ontario agreement, Ontario Hydro is co-operating with Atomic Energy of Canada Limited in studies of techniques for safe, long-term isolation from the environment of radioactive wastes. These included seismic site and rock-dynamics analyses and thermal rock mechanics studies to support AECL's development of proposed nuclear waste repositories in hard rock. Hydro has also been assigned the responsibility for interim storage and developing transportation techniques for nuclear wastes.

Following approval by the Board of Directors, Hydro commenced the second phase of the proposal for a 1,020-megawatt lignite-fuelled generating station at Onakawana in the James Bay lowlands. This phase includes an environmental assessment, fuel contract conditions, basic engineering studies and financial and contractual assessments.

The program for new hydro-electric development made good progress during the year with conceptual engineering activities concluded on 15 of the 17 projects included in the program.

Like most major corporations, Hydro places great emphasis on employee health and fitness. In the photo opposite, Katherine Nakanishi — who works in the nuclear communications centre at Pickering — happily exercises on equipment at the Fitness Centre in the corporation's head office.



The largest electrical utility in Canada

Ontario Hydro is the largest electrical utility in Canada — and second largest in North America. Its operation area extends roughly 1,610 kilometres (1,000 miles) from east to west and covers a quarter-million square miles.

The utility is a special statutory corporation established in 1906 by the Provincial Legislature. It has broad powers to produce, buy and deliver electric power throughout the province. Ontario Hydro operates under The Power Corporation Act, Revised Statutes of Ontario 1970, c. 354 as amended. Hydro is responsible for certain regulatory functions over the

electrical services provided by Ontario's municipalities.

Ontario Hydro is administered by a Board of Directors consisting of a chairman, a vice-chairman, a president and not more than 10 other directors. Regular review of strategy, programs and resources is a function of the Executive Office, composed of the chairman, the president, the two executive vice-presidents and the secretary and general counsel.

The corporation's main responsibility is to provide power to municipalities, which in turn distribute the power to customers in their service

Hydro technicians using high-frequency measurements check the condition of transformer windings in service at the Pickering nuclear generating station.



Research biologists such as Bob Lyons (left) and James Sheldon, who banded and monitored the gull colony near the Bruce Nuclear Power Development, found that the birds' reproductive success is similar to that of gulls in other colonies on the Great Lakes.



Links make Hydro part of a massive grid

areas. In addition, Ontario Hydro supplies more than 100 major direct industrial customers and about 771,000 retail customers either in rural areas or in communities not served by municipal electric utilities.

Seven regional offices and 59 area offices throughout the province ensure efficient operation of Ontario Hydro's vast power network.

Its interconnections with other jurisdictions place the corporation in a massive electrical grid that blankets a large and important segment of the continent. There are links with Manitoba Hydro on the west, Hydro Quebec on the east and with utilities in Michigan and New York states to the south.

Ontario Hydro is a financially self-sustaining corporation that derives no revenue from taxes.

The Power Corporation Act by which Hydro is governed stipulates that power be provided to the municipal customers at cost. The Act defines cost as including charges for power purchases, operation, maintenance, administration, fixed charges and reserve adjustment. Fixed charges include interest, depreciation and the provisions for the retirement of debt over a 40-year period.

The province of Ontario guarantees the payment of the principal and interest on bonds and notes issued to the public by Ontario Hydro. In the case of public borrowing in the United States, the Province borrows on behalf of Hydro by issuing its own debentures and advancing the proceeds to Ontario Hydro upon terms and conditions agreed upon between the Corporation and the Treasurer of Ontario.

Operational audit program instituted in 1979

In April 1979, an Operational Audit Program was initiated using the value-for-money auditing concept to address questions of the economy, efficiency and effectiveness of Ontario Hydro in the conduct of its business.

The program was developed in conjunction with Clarkson Gordon, chartered accountants, who are also

participating with Ontario Hydro staff in carrying it out.

The primary aim of the program is to assist management by providing objective assessments of the functions, systems and activities of Ontario Hydro that are audited with a view to making improvements wherever there are opportunities to do so.

Hydro biologists Edward Checko, Lance Leonard-Barret and Blair Sim take fish samplings near the Bruce Heavy Water Plant. Their catch is then laboratory-analyzed.



A lineman in a cherry-picker is probably the image of Ontario Hydro uppermost in the public mind. Here Claude Haynes assists in a rural restringing job just south of Brampton.



Comparative Statistics

	1979	1978	1977	1974	1969
Operating					
Dependable peak capacity ('000 kW)	23,879	22,845	21,347	15,759	11,242
December primary peak demand ('000 kW) ...	16,365	15,722	15,677	13,538	10,555
Primary energy made available ('000,000 kW•h)	98,127	95,373	92,855	82,696	59,426
Customer					
Primary energy sales ('000,000 kW•h)					
Municipalities	63,342*	61,285	58,348	51,852	36,127
Retail	12,980*	12,927	13,021	10,736	6,921
Direct	15,644*	14,775	15,187	14,829	12,386
Total	91,966*	88,987	86,556	77,417	55,434
Secondary energy sales ('000,000 kW•h)	11,661	10,393	8,527	6,002	1,019
Total Ontario customers ('000)					
Residential	2,461*	2,411	2,358	2,190	1,984
Farm	113*	115	118	124	130
Commercial and industrial	316*	307	299	279	230
Total	2,890*	2,833	2,775	2,593	2,344
Average annual kW•h per customer					
Residential	9,900*	9,797	9,724	8,971	7,417
Farm	19,300*	18,279	17,554	15,300	11,668
Commercial and industrial	200,700*	200,601	201,384	195,322	165,675
Average revenue per kW•h (¢)					
Residential	3.16*	2.98	2.80	1.74	1.34
Farm	3.42*	3.21	3.02	2.06	1.78
Commercial and industrial	2.30*	2.17	2.08	1.21	0.90
Financial					
Bonds and other long-term debt issued (\$'000,000)	1,405	1,847	1,407	700	399
Gross expenditures on fixed assets (\$'000,000) .	1,659	1,694	1,425	890	447
Revenues (\$'000,000)					
Primary power and energy	2,222	1,849***	1,637**	896	469
Secondary power and energy	346	289	210	102	7
Assets (\$'000,000)	14,514	13,163	11,386	7,080	4,129
Staff, average for year	28,385	27,850	25,118	23,612	21,686

*Preliminary

**after deducting excess revenues of \$122 million

***after deducting excess revenues of \$130 million

Financial Review

Ontario Hydro's 1979 financial results showed an overall improvement and, for the first time since 1966, the Corporation's debt-equity ratio improved in comparison to the previous year. Net income amounted to \$268 million in 1979, an increase of \$120 million over 1978. However, 1979 results did not include two non-recurring items which reduced 1978 net income by \$151 million — an allowance of \$130 million for excess revenues payable to customers within the spirit and intent of the Anti-Inflation program; and an extraordinary charge of \$21 million which arose from the cancellation of two of the four oil-fuelled generating units under construction at Wesleyville.

Total 1979 revenues were \$2,568 million. Revenues from sales of primary power and energy in 1979 amounted to \$2,221 million, an increase of 12% over the previous year. This increase of \$242 million was primarily due to the 9.5% increase in bulk power rates and, to a lesser extent, increased volume of sales. In 1979 the total primary delivered load increased by 2.0% and delivered energy by 3.3% over 1978. Revenues from sales of secondary power and energy amounted to \$347 million in 1979, \$58 million or 20% higher than in 1978. This higher level of secondary revenues, resulting mainly from increased export sales to U.S. utilities, produced approximately \$155 million of net revenue for the Corporation.

Costs, excluding financing charges and extraordinary item, totalled \$1,646 million in 1979 compared to \$1,421 million in 1978, an increase of 16%. Operation, maintenance and administration costs were \$602 million in 1979, an increase of \$100 million or 20% over 1978. This increase resulted mainly from the escalation of labour and material costs, certain planning and development costs previously capitalized being charged to operations in 1979, and the costs of operating and maintaining new plants placed in service. The cost of fuel used for electric generation increased by \$119 million to \$606 million in 1979 reflecting a 6% increase in the volume of electricity generated by thermal stations and a 17% increase in the average unit cost of fuels burned. Payments required under the nuclear agreement payback increased by \$6 million in 1979. Charges for energy produced by generating units during commissioning decreased by \$19 million to only \$3 million in 1979 as a result of the reduced level of commissioning activity. Depreciation costs rose \$20 million in 1979 to \$285 million, mainly as the result of new units being in service throughout 1979 at the Nanticoke and Bruce "A" generating stations, and additional transformation and transmission facilities being placed in service.

Interest and foreign exchange costs charged to operations totalled \$654 million in 1979, \$105 million or 19% higher than 1978. Interest costs increased by \$63 million or 12% over 1978, reflecting financing costs associated with new plants in service, construction projects deferred during 1979, and new borrowings at higher interest rates. Foreign exchange costs totalled \$71 million in 1979, an increase of \$42 million over 1978 mainly resulting from the increased cost of retiring foreign debt at current rates of exchange.

The amount of net income appropriated for debt retirement, as required by The Power Corporation Act, increased by \$13

million in 1979 to \$126 million. The remaining \$142 million balance of 1979 net income was appropriated for stabilization of rates and contingencies compared to \$34 million in 1978.

The overall financial position of the Corporation, as reflected by the debt-equity and interest coverage ratios improved during 1979 and was mainly attributable to the higher level of net income.

Financial Ratios	1979	1978
Debt Equity	.848	.853
Interest Coverage	1.26	1.19

In 1979 the major application of funds was for the construction of new plant and facilities. Net additions to fixed assets were \$1,575 million, comprised of \$1,038 million for generation facilities, \$258 million for transmission and distribution facilities, \$184 million for heavy water plants, and \$122 million for the production of heavy water. Net additions were \$77 million lower than those in 1978 mainly the result of proceeds of \$103 million on sales of heavy water in 1979. The expenditures during 1978 and 1979 on major generation facilities under construction were:

	1979 Expenditures \$ million	1978 Expenditures \$ million
Major Generation Facilities Under Construction		
Nuclear Generating Stations		
Bruce "B"	386	144
Pickering "B"	326	276
Darlington	56	36
Fossil Generating Stations		
Thunder Bay	124	101
Atikokan	25	16

Other 1979 application of funds represent increases in fuel, materials and supplies of \$188 million, increases in advance payments for fuel supplies of \$127 million, and \$130 million for excess revenues rebated to customers within the spirit and intent of the Anti-Inflation program.

Funds provided from operations in 1979 amounted to \$552 million while net financing provided \$1,430 million. Compared to 1978, these amounts increased by \$119 million and \$195 million respectively. In addition, increases in accounts payable and accrued interest amounted to \$102 million in 1979.

Proceeds from the issue of long-term bonds, notes and other long-term debt during 1979 totalled \$1,405 million. Canadian currency issues of \$600 million, issues in United States currency of \$600 million (Canadian \$706 million), and a floating rate bank loan of 68 million Swiss francs (Canadian \$48 million) were floated during 1979. Additional long-term debt financing was provided by leases of capital equipment valued at \$13 million and a borrowing arrangement for the acquisition of uranium valued at \$38 million. Retirement of long-term debt during the year amounted to \$288 million. The average coupon interest rate of bond issues in 1979 was 9.9%, as compared to an average rate of 9.3% in 1978. In addition, the level of cash and investments decreased by \$318 million during 1979.

Auditors' Report

We have examined the statement of financial position of Ontario Hydro as at December 31, 1979 and the statements of operations, reserve for stabilization of rates and contingencies, equities accumulated through debt retirement appropriations and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

As explained in note 6, Bruce Heavy Water Plant "D" and the Wesleyville Generating Station, which have an unamortized cost of \$656 million at December 31, 1979, have been deferred and it is not known when these assets will be used.

In our opinion, subject to the effect, if any, on the

financial statements of the ultimate resolution of the uncertainty discussed in the preceding paragraph, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1979 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles. Further in our opinion, except for the changes in accounting policies described in the summary of significant accounting policies and in note 14 to the financial statements, such accounting principles have been applied on a basis consistent with that of the preceding year.

Toronto, Canada
March 10, 1980

CLARKSON GORDON
Chartered Accountants

Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with accounting principles generally accepted in Canada, applied on a consistent basis except for the changes described under "Depreciation", "Advance payments for fuel supplies", "Fuel for electric generation", "Pension plan" and "Research and development". In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 10, 1980. To assist the reader in understanding the financial statements, the Corporation's significant accounting policies are summarized below:

Fixed assets

Fixed assets are capitalized at cost which is comprised of material, labour and engineering costs, plus overheads and interest applicable to the capital construction program. In the case of generation facilities, cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by units during their commissioning period. The cost of heavy water is the direct cost of production and applicable overheads, plus interest and depreciation on the heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. The effective annual rates were 10% in 1979 and 9.9% in 1978.

If it is decided to significantly extend the construction period of a project, interest is not capitalized on construction during the period of extension. If a project is deferred after construction has started, mothballing costs associated with the deferment are charged to operations. Interest is not capitalized on deferred projects during the period of their deferral. If a project is cancelled, all costs, including the costs of cancellation, are written off to operations.

Depreciation

In 1979, all fixed assets in service, except land, are depreciated on a straight-line estimated service life basis. Prior to 1979, all fixed assets were depreciated on a straight-line basis, except for hydraulic generation, transmission, distribution and administration assets placed in service before January 1, 1971, which were depreciated on a sinking fund basis. The straight-line method was adopted effective January 1, 1979 for those assets previously depreciated on a sinking fund basis.

Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Any changes in service life estimates are implemented on a remaining service life basis. Effective January 1, 1979, the estimated service lives of certain transmission and distribution assets, and the service life of heavy water, were revised.

The estimated service lives of assets in the major classes are:

Generation — hydraulic	— 50 to 100 years
— fossil and nuclear	— 30 years
Heavy water	— over the period ending in the year 2030 (1978 — 30 years)
Transmission and distribution	— 25 to 55 years (1978 — 25 to 50 years)
Administration and service	— 5 to 60 years
Heavy water production facilities	— 20 years

In accordance with the group depreciation practices of the utility industry, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, losses on premature retirements, and the costs of removal less salvage proceeds on all retirements, are reflected as adjustments to depreciation expense in the year incurred.

The costs of deferred projects are amortized so that any estimated loss in value is charged to operations on a straight-line basis over the expected deferral period. The annual amortization rates, which are subject to periodic review, are 2.5% for Bruce Heavy Water Plant "D" and 1.67% for the Wesleyville Generating Station.

Advance payments for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term contracts for the supply of coal, oil and uranium. Where these contracts require Ontario Hydro to make payments to suppliers in advance of product delivery for pre-production costs, these payments and associated costs, including interest, are carried in the accounts as advance payments for fuel supplies. The advance payments are amortized to fuel inventory as the fuels are delivered under the contracts.

Interest is capitalized as part of advance payments and is charged to fuel inventory as the fuels are delivered. In prior years, interest on advance payments was charged to operations as interest expense as soon as the first delivery of fuel under the contracts had commenced.

Fuel for electric generation

The cost of fuel for electric generation is comprised of fuel purchases, transportation and handling costs, and the amortization of advance payments for fuel supplies. The cost of borrowed fuel is the discounted present value of both lease payments and estimated future replacement costs. Transportation costs include interest and depreciation on railway equipment owned by Ontario Hydro. Prior to 1979, interest on railway equipment was charged to operations as interest expense. Fuel used for electric generation is charged to operations on the average cost basis.

Nuclear agreement — Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Commissioning energy

Revenues from the sale of power and energy include revenues from energy produced by generating units during the commissioning period. A charge is included in the cost of operations for the value attributed to the energy produced during the commissioning period. This charge is equivalent to the operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity.

Appropriations from net income

Under the provisions of The Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies.

The debt retirement appropriation is the amount required under the Act to accumulate in 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for or withdrawal from the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Foreign currency translation

Long-term debt payable in foreign currencies is translated to Canadian currency at rates of exchange at the time of issue. Current monetary assets and liabilities, including long-term debt payable within one year, are adjusted to Canadian currency at year-end rates of exchange. The resulting

translation gains or losses, together with realized exchange gains or losses, are credited or charged to operations.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. The pension costs for each period, as actuarially determined, include current service costs and amounts required to amortize any unfunded liability. Commencing January 1, 1979 all unfunded liabilities are being amortized over a fifteen year period. Prior to 1979, those arising from changes in actuarial assumptions or from experience deficiencies were being amortized on a five year basis.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility. Prior to 1979, certain development costs and expenditures related to the overall planning of the power system had been capitalized. These costs are being amortized over a 10 year period.

Statement of Operations
for the year ended December 31, 1979

	1979	1978
	\$'000	\$'000
Revenues		
Primary power and energy		
Municipal utilities	1,441,557	1,275,107
Retail customers	474,795	443,721
Direct customers	305,210	261,816
	<u>2,221,562</u>	<u>1,979,147</u>
Secondary power and energy	346,558	288,533
	<u>2,568,120</u>	<u>2,267,680</u>
Less excess revenues (note 1)	—	130,292
	<u>2,568,120</u>	<u>2,137,388</u>
Costs		
Operation, maintenance and administration	601,422	501,800
Fuel used for electric generation	605,839	487,037
Power purchased	98,456	97,949
Nuclear agreement — payback	53,195	46,936
Commissioning energy	2,776	21,866
Depreciation (note 2)	284,610	265,060
	<u>1,646,298</u>	<u>1,420,648</u>
Income before financing charges and extraordinary item	<u>921,822</u>	<u>716,740</u>
Interest (note 3)	583,332	519,449
Foreign exchange (note 4)	70,875	29,346
	<u>654,207</u>	<u>548,795</u>
Income before extraordinary item	<u>267,615</u>	<u>167,945</u>
Extraordinary item (note 6)	—	20,500
Net income	<u>267,615</u>	<u>147,445</u>
Appropriation for:		
Debt retirement as required by The Power Corporation Act	125,932	113,446
Stabilization of rates and contingencies	141,683	33,999
	<u>267,615</u>	<u>147,445</u>

See accompanying summary of significant
accounting policies and notes to financial statements


Statement of Financial Position
as at December 31, 1979

Assets	1979	1978
	\$'000	\$'000
Fixed assets		
Fixed assets in service (note 5)	10,441,984	9,549,008
Less accumulated depreciation	2,147,326	1,859,391
	8,294,658	7,689,617
Construction in progress (note 5)	3,674,929	3,526,802
Deferred construction projects (note 6)	659,255	124,542
	12,628,842	11,340,961
Current assets		
Cash and short-term investments (note 7)	381,102	692,884
Accounts receivable	292,643	254,785
Fuel for electric generation (note 8)	579,209	409,781
Materials and supplies, at cost	132,905	112,129
	1,385,859	1,469,579
Other assets		
Advance payments for fuel supplies (note 9)	267,383	140,703
Long-term investments (note 10)	53,426	59,555
Unamortized debt discount and expense	117,567	105,635
Long-term accounts receivable and other assets	60,652	46,073
	499,028	351,966
	14,513,729	13,162,506

See accompanying summary of significant accounting policies and notes to financial statements.

Liabilities	1979	1978
	\$'000	\$'000
Long-term debt		
Bonds and notes payable (note 11)	11,206,395	10,129,119
Other long-term debt (note 12)	309,330	269,556
	11,515,725	10,398,675
Less payable within one year	381,540	171,912
	11,134,185	10,226,763
Current liabilities		
Accounts payable and accrued charges	615,416	529,500
Short-term notes payable	20,070	
Accrued interest	289,941	
Long-term debt payable within one year	381,540	
Excess revenues payable (note 1)	3,039	132,544
	1,310,006	1,132,950
Equity		
Equities accumulated through debt retirement appropriations ..	1,516,026	1,391,181
Reserve for stabilization of rates and contingencies	426,817	284,917
Contributions from the Province of Ontario as assistance		
for rural construction	126,695	126,695
	2,069,538	
	14,513,729	13,162,506

On behalf of the Board




Chairman
President

Toronto, Canada
March 10, 1980

Equities Accumulated through Debt Retirement Appropriations for the year ended December 31, 1979

	Municipalities	Power District (Retail and Direct Customers)	Totals	
			1979	1978
	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year	967,921	423,260	1,391,181	1,279,667
Add:				
Debt retirement appropriation	85,059	40,873	125,932	113,446
Annexation transfers and refunds	5,631	(6,718)	(1,087)	(1,932)
Balances at end of year	1,058,611	457,415	1,516,026	1,391,181

Reserve for Stabilization of Rates and Contingencies for the year ended December 31, 1979

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
		Munici- palities	Retail Customers	Direct Customers	1979	1978
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year	319,909	1,144	(32,561)	(3,575)	284,917	250,401
Appropriation	130,354	109	8,012	3,208	141,683	33,999
Deficit recovered from municipalities on annexations	(73)	—	399	—	326	621
Payment to Ontario Municipal Electric Association (note 13)	—	(109)	—	—	(109)	(104)
Balances at end of year	450,190	1,144	(24,150)	(367)	426,817	284,917

See accompanying summary of significant
accounting policies and notes to financial statements.

Statement of Changes in
Financial Position
for the year ended December 31, 1979

	1979	1978
	\$'000	\$'000
Source of Funds		
Operations		
Income before extraordinary item	267,615	167,945
Depreciation, a charge not requiring funds in the current year	284,610	265,060
	552,225	433,005
Financing		
Long-term debt		
Bonds, notes and other long-term debt issued ..	1,404,844	1,846,530
Less retirements	287,794	308,618
	1,117,050	1,489,912
Short-term notes payable — (decrease)	(5,345)	(19,520)
Cash and investments — decrease (increase) ...	317,911	(235,843)
	1,429,616	1,234,549
Increase in accounts payable and accrued interest	102,278	149,998
	2,084,119	1,817,552
Application of Funds		
Net additions to fixed assets (note 16)	1,574,716	1,652,043
Increase in fuel, materials and supplies	187,979	65,137
Increase in advance payments for fuel supplies	126,680	45,626
Decrease (increase) in excess revenues payable (note 1)	129,505	(10,451)
Increase in accounts receivable and other assets	65,239	44,697
Extraordinary item (note 6)	—	20,500
	2,084,119	1,817,552

See accompanying summary of significant
accounting policies and notes to financial statements.

Notes to Financial Statements

1. Anti-Inflation program

Ontario hydro was required by the Province of Ontario to conform with the spirit and intent of the Federal Anti-Inflation program as it applied to net income for the years 1977 and 1978. The excess revenues payable at December 31, 1978, together with interest, are being applied to reduce customers' bills in 1979 and 1980.

2. Depreciation

	1979	1978
	\$'000	\$'000
Depreciation of fixed assets in service	326,070	294,316
Amortization of deferred construction projects	8,156	702
Costs of removal less salvage proceeds on retirements	3,894	3,021
	<u>338,120</u>	<u>298,039</u>
Less:		
Depreciation charged to heavy water production	22,269	16,236
Depreciation capitalized as construction in progress	16,435	13,497
Depreciation charged to fuel for electric generation	2,225	490
Net gains on sales of fixed assets	12,581	2,756
	<u>53,510</u>	<u>32,979</u>
	<u>284,610</u>	<u>265,060</u>

3. Interest

	1979	1978
	\$'000	\$'000
Interest on bonds, notes, and other debt	1,029,568	899,817
Less:		
Interest charged to — construction in progress	282,213	272,649
— heavy water production	35,865	26,122
— advance payments for fuel supplies	18,295	5,348
— fuel for electric generation	4,700	—
Interest earned on short-term and long-term investments	89,459	70,457
Net gain on redemption of bonds and sale of investments	15,704	5,792
	<u>446,236</u>	<u>380,368</u>
	<u>583,332</u>	<u>519,449</u>

4. Foreign exchange

	1979	1978
	\$'000	\$'000
Exchange loss on refinancing of foreign long-term debt	33,281	48,278
Exchange loss on redemption and translation of foreign long-term debt	30,052	18,338
Net exchange loss (gain) on other foreign transactions	7,542	(37,270)
	<u>70,875</u>	<u>29,346</u>

5. Fixed assets

	1979			1978		
		\$'000			\$'000	
	Assets in Service	Accumulated Depreciation	Construction in Progress	Assets in Service	Accumulated Depreciation	Construction in Progress
Generation — hydraulic ...	1,729,400	360,153	8,976	1,717,361	330,071	8,915
— fossil	2,231,864	556,224	377,204	2,189,857	481,504	421,833
— nuclear	1,878,802	183,467	1,930,619	1,507,317	117,110	1,513,130
Heavy water	589,484	56,227	110,632	479,455	45,871	193,263
Transmission and distribution	3,063,815	722,375	456,491	2,851,931	667,176	378,212
Administration and service .	502,776	170,882	8,098	434,735	143,444	36,780
Heavy water production facilities	445,843	97,998	782,909	368,352	74,215	974,669
	<u>10,441,984</u>	<u>2,147,326</u>	<u>3,674,929</u>	<u>9,549,008</u>	<u>1,859,391</u>	<u>3,526,802</u>

Construction in progress at December 31, 1978 included \$192 million for the fossil-fired Wesleyville Generating Station and \$200 million for Bruce Heavy Water Plant "D" which were transferred to deferred construction projects in 1979 (see note 6). Construction in progress at December 31, 1979 is comprised of:

	Planned In-Service Dates	Generating Capacity to be Installed	Costs Incurred to December 31, 1979	Estimated Future Costs to Complete (Including Escalation)
		MW	\$ millions	\$ millions
Nuclear generating stations (including heavy water)				
Pickering "B"	1982-84	2,160	1,253	1,620
Bruce "B"	1983-87	3,200	623	3,540
Darlington	1988-91	3,600	118	7,000
Fossil generating stations				
Thunder Bay	1981	300	295	110
Atikokan	1984-88	400	48	810
Bruce Heavy Water Plant "B"	1980	—	781	70
All other construction in progress	—	—	557	—
			<u>3,675</u>	

The above estimates are the most recent forecasts as of March 10, 1980. Because of long construction lead times on these projects, the assumptions underlying these forecasts are subject to change which may affect the planned in-service dates and estimated future costs to complete.

6. Deferred construction projects

	1979			1978		
	Capital Cost	\$'000 Accumulated Amortization	Unamortized Cost	Capital Cost	\$'000 Accumulated Amortization	Unamortized Cost
Bruce Heavy Water Plant "D"	419,013	3,850	415,163	120,000	—	120,000
Wesleyville Generating Station	244,520	3,733	240,787	—	—	—
	663,533	7,583	655,950	120,000	—	120,000
Minor projects	5,941	2,636	3,305	6,605	2,063	4,542
	<u>669,474</u>	<u>10,219</u>	<u>659,255</u>	<u>126,605</u>	<u>2,063</u>	<u>124,542</u>

As a result of significantly reduced load forecasts in 1978 and 1979, the Board of Directors made the following revisions to the capital construction program:

Bruce Heavy Water Plant "D".
 In 1978, it was decided to stop construction on the second half of the plant and store the components. In 1979 it was decided to complete construction and then mothball the first half of the plant. It is uncertain at this time when the plant will be used.

Wesleyville Generating Station.
 In 1978, units 1 and 2 were cancelled and associated costs of \$20.5 million were written off as an extraordinary charge against income. In 1979, it was decided to stop construction on units 3 and 4 and store the components until the early 1990's.

Mothballing costs associated with the above deferrals amounting to \$20 million were charged to operations in 1979 (1978 — \$15 million).

7. Cash and short-term investments

	1979	1978
	\$'000	\$'000
Cash and interest bearing deposits with banks and trust companies	276,366	595,929
Corporate bonds and notes	85,628	77,074
Government and government-guaranteed bonds	19,108	19,881
	<u>381,102</u>	<u>692,884</u>

Cash and short-term investments are recorded at cost which approximates market value.

8. Fuel for electric generation

	1979	1978
	\$'000	\$'000
Coal inventories	460,115	319,027
Uranium inventories	87,903	52,203
Oil inventories	31,191	38,551
	<u>579,209</u>	<u>409,781</u>

9. Advance payments for fuel supplies

	1979	1978
	\$'000	\$'000
Coal supply	89,694	69,181
Uranium supply	177,689	71,522
	<u>267,383</u>	<u>140,703</u>

Based on present commitments, additional advance payments for fuel supplies, excluding interest, will total approximately \$424 million over the next five years (including approximately \$147 million in 1980).

10. Long-term investments

	1979	1978
	\$'000	\$'000
Government and government-guaranteed bonds	53,426	59,555

Long-term investments are recorded at amortized cost. Their market value at December 31, 1979 was \$38 million (1978 — \$46 million).

11. Bonds and notes payable

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of maturity	1979			Weighted Average Coupon Rate	1978	
	Principal Outstanding \$'000		Total		Principal Outstanding \$'000	Weighted Average Coupon Rate
	Canadian	Foreign			Total	
1979	—	—	—		161,348	
1980	113,050	251,867	364,917		340,106	
1981	238,068	90,406	328,474		332,541	
1982	206,434	227,507	433,941		390,221	
1983	171,756	203,443	375,199		379,267	
1984	99,130	115,633	214,763		—	
1 - 5 years	828,438	888,856	1,717,294	7.1%	1,603,483	7.2%
6 - 10 years	303,448	712,798	1,016,246	7.8	1,142,355	7.5
11 - 15 years	301,796	238,872	540,668	7.9	471,255	7.6
16 - 20 years	1,094,750	521,259	1,616,009	8.2	1,410,356	8.0
21 - 25 years	1,632,803	757,747	2,390,550	9.4	1,836,230	9.3
26 - 30 years	1,395,971	2,529,657	3,925,628	9.4	3,665,440	9.2
	5,557,206	5,649,189	11,206,395		10,129,119	

Currency in which payable

Canadian dollars	5,557,206	5,162,889
United States dollars	5,338,998	4,679,236
West German Deutsche marks	95,911	124,055
Swiss francs	214,280	162,939
	<u>11,206,395</u>	<u>10,129,119</u>

Bonds and notes payable in United States dollars include \$4,072 million (1978 — \$3,420 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Except for these issues and a note of \$109 million payable in Swiss francs, all bonds and notes payable are guaranteed as to principal and interest by the Province of Ontario.

Long-term bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at time of issue. If Ontario Hydro were to translate the face value of its foreign bonds and notes payable at year-end rates of exchange, the total amount of these liabilities would have to be increased by \$730 million at December 31, 1979 (1978 — \$873 million).

12. Other long-term debt

	1979	1978
	\$'000	\$'000
The balance due to Atomic Energy of Canada Limited for the purchase of Bruce Heavy Water Plant "A". Under the purchase agreement, Ontario Hydro pays equal monthly instalments of blended principal and interest to December 28, 1992, with interest at the rate of 7.795%	207,223	216,184
Capitalized lease obligation for the head office building at 700 University Avenue, Toronto. The lease obligation is for the 30-year period ending September 30, 2005, payable in United States dollars at an effective interest rate of 8%	42,960	43,457
Capitalized lease obligations for transport and service equipment. Under these agreements, payments of equal monthly instalments of blended principal and interest will be made to 1988, at effective interest rates ranging from 6.8% to 10.8%	21,344	9,915
Liability for borrowed uranium. The liability represents the present value, discounted at an effective interest rate of 10.633%, of monthly lease payments and the estimated future replacement cost of a quantity of uranium borrowed in January, 1979 from Uranium Canada Limited for current consumption. The quantity borrowed is to be returned in December, 1983	37,803	—
	<u>309,330</u>	<u>269,556</u>

Payments required on the above debt, exclusive of interest, will total \$112 million over the next five years. The amount payable within one year is \$17 million (1978 — \$10.6 million).

13. Payment to Ontario Municipal Electric Association

The amount of this payment is equivalent to interest on the balance held for the benefit of Municipalities in the Reserve for Stabilization of Rates and Contingencies.

14. Changes in accounting policies and estimates

Changes in accounting policies and estimates, as described in the Summary of Significant Accounting Policies, were implemented effective January 1, 1979. As a result, the net income for the year ended December 31, 1979 has been increased (decreased) by the following amounts:

	\$ millions
Depreciation	
Adoption of straight-line basis for depreciation	(8)
Revision to service life estimates	12
Advance payments for fuel supplies	
Change in accounting for interest	7
Fuel for electric generation	
Change in accounting for interest	3
Pension plan	
Change in amortization period for unfunded liabilities	3
Research and development	
Change in accounting for planning and development costs	(31)
	<u>(14)</u>

15. Pension plan

The most recent actuarial valuation of the pension plan, at December 31, 1978, reported that Ontario Hydro's unfunded liability was approximately \$23 million (December 31, 1977 — \$133 million). The significant actuarial assumptions used in the 1978 valuation (1977 valuation) were:

- rate used to discount future investment income and benefits 7% (1977 — 6%)
- salary escalation rate 6.75% (1977 — 5.5%)
- average retirement age 62.4 for males, 61.0 for females (1977 — 62.1 and 60.7)
- common stocks are valued at 5 year average (1977 — 4 year average)

The net effect of the above changes in valuation assumptions, together with favourable investment experience, combined to reduce the estimated unfunded liability by \$95 million.

The pension plan costs for 1979 were \$48 million (1978 — \$80 million), including \$4 million (1978 — \$36 million) for the amortization of past service costs. The decrease of \$32 million in the amount amortized for past service costs resulted mainly from the reduction in the unfunded liability described above, and the change in the amortization period described in the Summary of Significant Accounting Policies and referred to in note 14.

16. Net additions to fixed assets

Net additions to fixed assets are capital construction program expenditures, net of proceeds on sales of assets. In 1979, net additions to heavy water reflect proceeds on sales amounting to \$103 million. For 1980, net additions to fixed assets are forecast at \$1,740 million.

17. Research and development

In 1979, approximately \$39 million of research and development costs were charged to operations and \$4 million were capitalized.

Pension and Insurance Fund Statement of Assets as at December 31, 1979

	1979	1978
	\$'000	\$'000
Fixed income securities		
Government and government-guaranteed bonds ..	286,541	159,271
Corporate bonds	143,125	131,069
First mortgages	340,026	287,377
Total fixed income securities	769,692	577,717
Equities — corporate shares	269,531	262,404
Cash and short-term investments	87,957	124,295
Total investments	1,127,180	964,416
Accrued interest and dividends	15,915	11,827
Receivable from Ontario Hydro	748	1,786
	<u>1,143,843</u>	<u>978,029</u>

Notes

1. The most recent actuarial valuation of the pension plan, at December 31, 1978, reported that Ontario Hydro's unfunded liability was approximately \$23 million. This unfunded liability is being amortized over a fifteen year period.
2. In the above statement of assets, bonds are included at amortized cost, first mortgages at balance of principal outstanding and shares at cost. Total bonds and shares at December 31, 1979 with a book value of \$699 million had a market value of \$732 million. (1978 book value \$553 million — market value \$576 million).

Auditors' Report

(Pension and Insurance Fund)

We have examined the statement of assets of The Pension and Insurance Fund of Ontario Hydro as at December 31, 1979. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement presents fairly the assets of the fund as at December 31, 1979.

Toronto, Canada
March 10, 1980

CLARKSON GORDON
Chartered Accountants

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